

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
J. PAUL PLUMMER
EXXONMOBIL UPSTREAM RESEARCH COMPANY
CORP-URC-SW348
P.O. BOX 2189
HOUSTON, TX 77252-2189

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing (day/month/year) **16 FEB 2006**

Applicant's or agent's file reference

2003UR039

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/US04/30669

International filing date (day/month/year)

20 September 2004 (20.09.2004)

Priority date (day/month/year)

06 November 2003 (06.11.2003)

International Patent Classification (IPC) or both national classification and IPC

IPC(8): F25J 1/00; F02C 6/18, 6/00; F02G 3/00; F01D 15/00 and US Cl.: 62/613, 611; 60/39.07, 39.05, 39.182, 39.3; 290/52

Applicant

EXXONMOBIL UPSTREAM RESEARCH COMPANY

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (571) 273-3201

Date of completion of this opinion

08 February 2006 (08.02.2006)

Authorized officer

William C. Doerfler

Telephone No. (571) 272-3750

Form PCT/ISA/237 (cover sheet) (April 2005)

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US04/30669

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of:

- ☒ the international application in the language in which it was filed
- ☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing
- ☐ table(s) related to the sequence listing

b. format of material

- ☐ on paper
- ☐ in electronic form

c. time of filing/furnishing

- ☐ contained in the international application as filed.
- ☐ filed together with the international application in electronic form.
- ☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US04/30669

Box No. V Reasoned statement under Rule 43 bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims <u>1-11</u>	YES
	Claims <u>NONE</u>	NO
Inventive step (IS)	Claims <u>NONE</u>	YES
	Claims <u>1-11</u>	NO
Industrial applicability (IA)	Claims <u>1-11</u>	YES
	Claims <u>NONE</u>	NO

2. Citations and explanations:

Claims 1-11 lack an inventive step under PCT Article 33(3) as being obvious over Kikkawa et al (US 5,689,141) in view of Cohn et al (US 5,491,969). Kikkawa et al disclose applicants' basic inventive concept, a natural gas liquefying device which derives electrical energy from a starter motor/generator with a frequency converter to increase the frequency during start-up (see lines 1-27 of column 6) and using the motor generator to supplement the energy derived from the turbine if necessary, substantially as claimed with the exception of returning electricity to the electrical grid and showing the generator between the compressor and the turbine. Cohn et al show these feature to be old in the compressor/turbine/generator art. It would have been obvious to one of ordinary skill in the art at the time of applicants' invention from the teaching of Cohn et al to modify the liquefying/generating system of Kikkawa et al by using grid electricity to start the system with energy being returned to the grid when possible to use available energy for start-up and to supply the energy where it can be best utilized and to place the generator between the compressor and the turbine to ensure proper energy transfer to the generator. In regard to claims 3,4,10 and 11, it is noted that pulse width modulation and modular construction are well known in the frequency converter art and as such would have been obvious to an ordinary practitioner in the art.

Claims 1-11 meet the criteria set out in PCT Article 33(4), and thus possess industrial applicability because the subject matter claimed can be made or used in industry.